

**Automatic Daylighting Harvesting Controls**

***Luminaire-integrated Control***– controllable ballast(s), driver(s), dimmer(s), control electronics, and/or sensors that are installed and factory wired into luminaire(s). Components not within the luminaire but connected using plug-in connections and low voltage wiring or fiber optics are allowed.

***Automatic Lighting Control System*** – lighting controls in which interconnected components such as sensors, clocks, control and communication electronics, and ballasts, drivers and/ or dimmers work together to automatically control lighting.

***Automatic Daylight Harvesting Control System*** – an automatic lighting control system employing photoelectric daylight sensor(s) and/or solar time clocks to determine system response. The system adjusts electric light levels based on time and/or the signals from one or more photo sensors.

***Proprietary Lighting Control System*** - a lighting control system in which only specific products, generally of one company, must be used.

***Proprietary Front End Lighting Control System*** – a lighting control system in which the sensors and electronics are a proprietary system, but will operate any compatible generic ballast, driver or dimmer

***Generic System*** – a lighting control system in which devices of more than one manufacturer are designed to operate with devices of other manufacturers according to an industry standard protocol. Examples of generic systems include 0-10 volt (analog) and DMX-512 and DALI (digital).

***Dimming Ballast*** – controllable multi-level or dimming ballasts for fluorescent or HID lamps, including RF exciters for induction lamps.

***Design Light Level*** – the maintained light level achieved solely by the electric lighting system

***Deadband*** – a feature of control systems in which a range (band) of changes in light level are ignored by the sensor to prevent annoying flashing of lights.

***Driver*** – driver for LED lamps permitting control functions including dimming

***Dimmer*** – devices for dimming incandescent, neon, cold cathode and driverless LED systems; may include phase control, DC and variable AC voltage devices such as motorized autotransformers

***Relay*** – device(s) for switching lighting by a control system; may include electronic relays, contactors and similar devices.

***Delay*** – a feature of control systems in which changes exceeding the deadband are responded after a time delay to prevent annoying flashing of lights. Delay may include a combination of integration, ramping, time delay or other circuits that are appropriate for the control system being employed.

## SECTION 119 – MANDATORY REQUIREMENTS FOR LIGHTING CONTROL DEVICES, SYSTEMS, BALLASTS, AND LUMINAIRE-INTEGRATED CONTROLS

Any lighting control device, dimmer, driver, ballast, or integrated control luminaire subject to the requirements of Section 119 shall be installed only if the manufacturer has certified to the Energy Commission that such complies with all of the applicable requirements of Section 119.

The manufacturers of proprietary lighting control systems including the proprietary portion of a proprietary front end system shall certify to the Energy Commission that the system complies with all of the applicable requirements of Section 119. Manufacturers of generic lighting system control components shall certify to the Energy Commission that the component complies with all of the applicable requirements of Section 119 when used in conjunction with other generic components and shall identify the generic system to which it is designed. Manufacturers of integrated control luminaires shall certify to the Energy Commission that the luminaire's control performance complies with Section 119 including any other peripheral devices that might be connected to meet these requirements.

f) **Automatic Daylight Harvesting Controls.** Automatic daylight harvesting controls used to control lights in daylit zones shall:

1. Be capable of automatically reducing the light level of general lighting in the controlled area by at least 65% when daylight alone achieves the design light level; and,
2. If the controls are placed in calibration mode, automatically restore normal operation settings to normal after no more than 60 minutes; and
3. Provide a means for making field calibration adjustments in a manner that the person making the adjustments has little or no impact on the calibration accuracy, and
4. Be furnished with complete instructions for installation, calibration, and testing; and,
5. Provide factory trained personnel to assist in installation, calibration and testing for any installation exceeding 10,000 square feet of daylit space.

### Section 131

(c) **Controls for Daylit Areas.** Luminaires providing general lighting that are in or are partially in the interior skylit daylight area and/or the primary sidelit daylight area shall be controlled as follows.

1. Primary sidelit and skylit daylight areas shall have at least one automatic daylight harvesting control that automatically reduces the light level of general lighting in the controlled area by at least 50% when daylight alone achieves the design light level.

**EXCEPTION to Section 131(c)1:** Automatic daylight harvesting controls are not required for any of the following:

- a. Primary sidelit and/or skylit daylight areas that have a combined area in the same enclosed space totaling less than or equal to 250 square feet.
- b. Spaces with electric lighting systems having a maximum lighting power density of less than 0.3 w/sf.
- c. Skylit daylight areas where the effective aperture is less than 0.006 per Section 146(a)2E
- d. Primary sidelit daylight areas where the effective aperture is less than 0.1 per Section 146(a)2E.

2. Automatic daylight harvesting controls shall be designed, installed, configured and tested to operate according to all of the following requirements:

- A. For each automatic daylight harvesting control, the following shall be shown on the plans
  - i. Location of sensor(s),
  - ii. Design light level(s)
  - iii. Test Point at which field measurements are to be taken. The test point shall be 30" above the floor and within the central 50% of the daylit area

- B. Installed in accordance with the plans and the manufacturer's instructions.
- C. Each automatic daylight harvesting control shall be commissioned to achieve the indicated design light level and manufacturer's recommended deadbands, delays and other adjustments.
- D. Each automatic daylight harvesting control shall be tested:
  - i. During daytime, to confirm at least 50% reduction in electric lighting level when the daylight level alone meets or exceeds the design light level at the test point(s).
  - ii. At nighttime, to confirm that the design light level is achieved at the test point(s).

EXCEPTIONS: Tests are not required for solar time lighting control systems when design light levels are 10 footcandles or less.